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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/982,721

Applicant(s)

SLOCOMBE ET AL.

Examiner

Ashok B. Patel

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9 and 14-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 18-29 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/25/2006, 10/31/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-29 are subject to examination. Claims 8 and 10-13 are cancelled.
Claims 18-29 are subjected to restriction requirements.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-7, 9 and 14-17 are drawn to a method of content delivery in a network wherein associating devices in a Domain Name System (DNS) with cache server systems located in the network and maintaining on each of the cache server systems content stored on an origin server; assigning to the DNS devices a common address; advertising, by each of the DNS devices, the common address within the network to indicate that the content is available for retrieval from each of the cache server systems by end user systems communicatively connected to the network; monitoring one or more load characteristics of one or more of the cache server systems in the network; determining if one or more of the load characteristics exceeds a predefined overload metric; and for each cache server system having a load characteristic that exceeds the predefined overload metric, discontinuing advertising of the common address by the associated DNS device, classified in class 709, subclass 242.

- II. Claims 18-29 are drawn to a method of content delivery, the method wherein (A) providing a plurality of CDN Domain Name System (DNS) servers, said DNS servers all sharing a common anycast address, at least some of said plurality of

DNS servers being located at network Points of Presence (POPs); (B) providing a plurality of content servers, each of said content servers associated with at least one of said plurality of CDN DNS servers, and each CDN DNS server of said plurality CDN DNS servers having at least one content server associated therewith, and each of said plurality of content servers being associated with a network Point of Presence (POP); (C) causing said plurality of DNS servers to be authoritative for at least one content provider domain by causing said common anycast address to be associated with said at least one content provider domain; (D) responsive to a request to resolve a hostname in said content provider domain, (d1) causing said hostname to be resolved to said common anycast address by at least one other DNS server, said at least one other DNS server being authoritative for said content provider's domain; and then (d2) by one of said plurality of DNS servers sharing said common anycast address, resolving said hostname to identify at least one of said content servers sites associated with said one of said DNS servers; (E) at one of said identified content servers, (e1) attempting to serve an object associated with the content provider by: (e11) if a valid version of said object is available on said one of said identified content servers, serving said object; otherwise (e12) obtaining the object from a content source and then serving the object", classified in class 370, subclasses 229,230,230.1,235,400 and class 707, subclass 10.

3. Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2)

that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because (B) providing a plurality of content servers, each of said content servers associated with at least one of said plurality of CDN DNS servers, and each CDN DNS server of said plurality CDN DNS servers having at least one content server associated therewith, and each of said plurality of content servers being associated with a network Point of Presence (POP); (C) causing said plurality of DNS servers to be authoritative for at least one content provider domain by causing said common anycast address to be associated with said at least one content provider domain; (D) responsive to a request to resolve a hostname in said content provider domain, (d1) causing said hostname to be resolved to said common anycast address by at least one other DNS server, said at least one other DNS server being authoritative for said content provider's domain; and then (d2) by one of said plurality of DNS servers sharing said common anycast address, resolving said hostname to identify at least one of said content servers sites associated with said one of said DNS servers; (E) at one of said identified content servers, (e1) attempting to serve an object associated with the content provider by: (e11) if a valid version of said object is available on said one of said identified content servers, serving said object; otherwise (e12) obtaining the object from a content source and then serving the object" is not required in combination I. The subcombination has separate utility such as advertising, by each of the DNS devices, the common address within the network to indicate that the content is available for retrieval from each of the cache server systems

by end user systems communicatively connected to the network; monitoring one or more load characteristics of one or more of the cache server systems in the network; determining if one or more of the load characteristics exceeds a predefined overload metric; and for each cache server system having a load characteristic that exceeds the predefined overload metric, discontinuing advertising of the common address by the associated DNS device

4. These inventions are distinct for the reasons given above, and the search required for each Group is different and not co-extensive for examination purpose. For example, the searches for the two inventions would not be co-extensive because these groups would require different searches on PTO's classification class and subclass as following:

- (a) Group I search would require use of search class 709, subclass 242.
- (b) Group II search would require use of search class 370, subclasses 229,230,230.1,235,400 and class 707, subclass 10.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and the extensive search required for one group is not required for the other groups, restriction for examination purposes as indicated is proper.

7. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

8. Newly submitted claims 18-29 are directed to an invention that is independent or distinct from the invention originally claimed for the reasons stated above.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 18-29 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless-

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-7, 9, and 14-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Garcia-Luna-Aceves (hereinafter Garcia) (US 2006/0271705 A1).

Referring to claim 1,

Garcia teaches a method of content delivery in a network (Abstract), comprising:

associating devices in a Domain Name System (DNS) (Note: Examiner interprets these associated devices as being any devices that are located in the Domain Name System., Fig. 2 ,elements 240, "WEB ROUTERS") with cache server systems located in the network (Fig. 2, elements 301, "WebCache", para. [0063], "FIG. 2 illustrates a virtual network of Web routers 201, 202, 205, 210, 220, 230, 240 and 250 defined on top of the physical topology of an internetwork, such as the Internet, consisting of routers interconnected via point-to-point links or networks. The virtual network of Web routers includes point-to-point links configured between the Web routers, and the links configured between a Web router and one or more Web caches (e.g., web cache 301) and content servers. Such links can be implemented using tunnels between Web routers and between Web routers and Web caches.", para. [0065], "A Web router may be co-located with a Web server, a Web cache, or an original content server. In one embodiment of the present invention, a Web router may be implemented in software to be executed by a general purpose (or special purpose) computer processor, or it may be implemented as part of the software of a router or Web cache. In another embodiment of the present invention, some or all of the Web router functionality may be implemented in hardware.") and maintaining on each of the cache server systems content stored on an origin server(para. [0071], "In one embodiment, if the Web router maps the address of the client requiring the location of information objects to addresses of Web caches that do not currently store such objects, the Web router can request the corresponding Web caches to obtain a copy of the required objects immediately after it provides the requesting Web server the

address of such a Web cache or proxy. In another embodiment, a Web cache or proxy attempts to retrieve a requested object from another Web cache or a content server only after it is contacted by a client and determines that a copy of the requested information object is not available locally. In both instances, the Web router provides the Web cache servicing a client request with the address of the "nearest" Web cache that stores the information object requested by the client; therefore, the Web cache needing the information object communicates directly with the Web cache storing the requested information object, without having to go through any intermediate Web caches and without having to know the content stored in all other Web caches as is customary in the prior art.");

assigning to the DNS devices a common address (para.[0158], "Thus a scheme for enabling the discovery of the caches and servers storing information objects distributed over computer networks, which can be implemented in hardware and/or software, has been described. It should be appreciated that some embodiments of the present invention make use of so-called network-layer URL (NURL) routing. This routing technique involves mapping requested URLs to unicast addresses, which are then used as an any cast IP address (i.e., a unicast address advertised by multiple, physically distinct points in an internet). See, e.g., Craig Partridge, Trevor Mendez, and Walter Milliken, "Host any casting service RFC 1546," November 1993. A system and method for using uniform resource locators (URLs) to map application layer content names to network layer anycast addresses, the aforementioned mapping, is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200,511,

entitled "System and Method for Using URLs to Map Application Layer Content Names to Network Layer Anycast Addresses", filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference. Furthermore, a system and method for using network layer URL routing to locate the closest server carrying specific content (network-level routing of URLs) is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200,402, entitled "System and Method for Using Network Layer URL Routing to Locate the Closest Server Carrying Specific Content (NURL Routing) filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference.");

advertising, by each of the DNS devices, the common address within the network to indicate that the content is available for retrieval from each of the cache server systems by end user systems communicatively connected to the network (para. [0067], "To reduce communication and processing overhead in Web routers, a topology of Web routers is defined, such that a given Web router has as its neighbor Web routers a subset of all the Web routers in the system (where the term system refers to all or a portion of the virtual network for Web routers discussed above). A Web router may thus be configured with its set of neighbor Web routers. Such a configuration may be a table of neighbor Web routers which is defined by a network service provider and/or is dynamically updated. In another embodiment of the present invention, a Web router dynamically selects the set of neighbor Web routers with which it should communicate out of all of the Web routers in the system. A Web router preferably communicates with

its neighbor Web routers only and uses the Web Information Locator by Distance (WILD) protocol for this purpose. The WILD protocol is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200401, entitled "System and Method for Discovering Optimum Information Object Repositories in Computer Networks (WILD Protocol), filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference.", para. [0070] The Web router maps each URL provided by the Web server to the address of a Web cache or the content server that can provide the associated information object to the client optimally according to the specified TOS parameters. This mapping of URLs to addresses of Web caches or content servers is accomplished by the collaboration among Web routers through WILD. Accordingly, the Web router contacted by the Web server can return the required addresses immediately after processing the request. In turn, the Web server returns a Web page to the requesting client that contains a URL for each information object that points to the Web cache or content server that can provide the information object to the client while meeting the TOS parameters specified in the client's request explicitly or implicitly. The client is then able to retrieve the information objects referenced in the Web page directly from a Web cache, proxy, or content server that has the best TOS path to the client. In other embodiments, the Web router may receive a request from a client, a cache, a Web server, another Web router, a name server, or another type of server, and use the address of the client and the TOS performance parameters specified in the request to obtain the address of a Web cache, set of Web caches, content server, or Web router (i.e., information object repository)

that should service the client optimally according to the specified TOS performance parameters.");

monitoring one or more load characteristics of one or more of the cache server systems in the network (para. [0043], "The specified performance metrics used may be one or more of an average delay from an information object repository to a selected client address or address range, an average processing delay at an information object repository, reliability of a path from an information object repository to a client, available bandwidth in such a path, and loads on an information object repository.");

determining if one or more of the load characteristics exceeds a predefined overload metric (para. [0086], "A Web router is informed by its local Web caches of the load in the Web caches and the information objects stored in the Web caches. Hence, a Web router knows that its distance to information objects stored in local Web caches is the latency incurred in obtaining those objects from the local Web caches, which is a direct function of the load in those Web caches."); and

for each cache server system having a load characteristic that exceeds the predefined overload metric, discontinuing advertising of the common address by the associated DNS device (para.[0086], "The specific algorithm that a Web router executes to compute the distance to the nearest Web cache storing a copy of an information object depends on the routing information that the Web routers use to compute distances to other Web routers, which are collocated with the Web caches storing information objects. A Web router is informed by its local Web caches of the load in the Web caches and the information objects stored in the Web caches. Hence, a Web

router knows that its distance to information objects stored in local Web caches is the latency incurred in obtaining those objects from the local Web caches, which is a direct function of the load in those Web caches. Given that a Web router executes a routing algorithm enabling the Web router to know its distance to other Web routers, a Web router selects the nearest Web cache storing a copy of an information object by comparing the local distance to the information object (which is the latency incurred by a local Web cache if the object is stored locally or infinity if the object is not stored locally) with the reported matches of object identifiers to Web caches reported by its neighbor Web routers. The object-cache match report for a given information object specifies the information object identifier, the Web cache where the information object is stored, the Web router that is local to that Web cache, and the distance to the Web cache. The distance specified in the object-cache match report includes explicitly or implicitly the distance from the neighbor Web router to the Web cache specified in the report, plus the load of the Web cache specified in the report. The Web router then chooses the match of information object to Web cache that produces the minimum distance to the Web cache storing the object.”)

Referring to claim 2,

Garcia teaches the method of claim 1, wherein the common address is an anycast address(para. [0067], “To reduce communication and processing overhead in Web routers, a topology of Web routers is defined, such that a given Web router has as its neighbor Web routers a subset of all the Web routers in the system (where the term system refers to all or a portion of the virtual network for Web routers discussed above).

A Web router may thus be configured with its set of neighbor Web routers. Such a configuration may be a table of neighbor Web routers which is defined by a network service provider and/or is dynamically updated. In another embodiment of the present invention, a Web router dynamically selects the set of neighbor Web routers with which it should communicate out of all of the Web routers in the system. A Web router preferably communicates with its neighbor Web routers only and uses the Web Information Locator by Distance (WILD) protocol for this purpose. The WILD protocol is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200401, entitled "System and Method for Discovering Optimum Information Object Repositories in Computer Networks (WILD Protocol), filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference.", para. [0070] The Web router maps each URL provided by the Web server to the address of a Web cache or the content server that can provide the associated information object to the client optimally according to the specified TOS parameters. This mapping of URLs to addresses of Web caches or content servers is accomplished by the collaboration among Web routers through WILD. Accordingly, the Web router contacted by the Web server can return the required addresses immediately after processing the request. In turn, the Web server returns a Web page to the requesting client that contains a URL for each information object that points to the Web cache or content server that can provide the information object to the client while meeting the TOS parameters specified in the client's request explicitly or implicitly. The client is then able to retrieve the information objects referenced in the Web page directly

from a Web cache, proxy, or content server that has the best TOS path to the client. In other embodiments, the Web router may receive a request from a client, a cache, a Web server, another Web router, a name server, or another type of server, and use the address of the client and the TOS performance parameters specified in the request to obtain the address of a Web cache, set of Web caches, content server, or Web router (i.e., information object repository) that should service the client optimally according to the specified TOS performance parameters.”).

Referring to claim 3,

Garcia teaches the method of claim 1, wherein the advertising act comprises: sending routing information to a plurality of routers in the network in accordance with the Border Gateway Protocol (BGP) (para. [0065], “A Web router may be co-located with a Web server, a Web cache, or an original content server. In one embodiment of the present invention, a Web router may be implemented in software to be executed by a general purpose (or special purpose) computer processor, or it may be implemented as part of the software of a router or Web cache. In another embodiment of the present invention, some or all of the Web router functionality may be implemented in hardware.”, para.[0082], “In an embodiment of the present invention, Web routers use routing information provided by the Border Gateway Protocol (BGP) and any of the intra-domain routing protocols (e.g., OSPF, EIGRP) running in the routers attached to the same local area networks where the Web routers reside to derive distances to client address ranges.”).

Referring to claim 4,

Garcia teaches the method of claim 1, wherein the cache server systems are geographically distributed across the network (para. [0083] The specific algorithm that a Web router executes to compute the TOS distance from each local Web cache to a client address range depends on the routing information that the attached routers make available to the Web router. Each Web router may be provided with inter-domain and intra-domain routing information pertaining to all known client address ranges; alternatively, only a subset of Web routers may receive inter-domain routing information directly from one or more routers present in the same network as the Web router. In either case, a Web router executes locally a path-selection algorithm, such as Dijkstra's shortest-path first algorithm, to compute the local TOS distance from attached Web caches to each client address range if the Web router has complete intra-domain and inter-domain routing data, or to the each client address range in the local autonomous system if the Web router only has intra-domain routing data. A Web router can execute a different path-selection algorithm to compute local TOS distances to address ranges for each TOS defined in the system.")

Referring to claim 5,

Garcia teaches the method of claim 1, wherein the DNS devices are collocated with the cache server systems with which the DNS devices are associated. (para.[0086], "The specific algorithm that a Web router executes to compute the distance to the nearest Web cache storing a copy of an information object depends on the routing information that the Web routers use to compute distances to other Web routers, which are collocated with the Web caches storing information objects.")

Referring to claim 6,

Garcia teaches the method of claim 1, wherein each cache server system and associated DNS devices are located in a different Internet Service Provider Point of Presence. (para.[0062], "For example, clients 105 may have accounts with local Internet service providers (ISPs) 110 that enable the clients to connect to the Internet using conventional dial-up or one of a variety of high-speed connections (e.g., DSL connections, cable connections, hybrids involving satellite and dial-up connections, etc.). ISPs 110, in turn, may provide direct connections to the Internet or, as shown, may rely on other service providers 120, 130, 140, to provide connections through to a set of high-speed connections between computer resources known as a backbone 150.", para. [0067] To reduce communication and processing overhead in Web routers, a topology of Web routers is defined, such that a given Web router has as its neighbor Web routers a subset of all the Web routers in the system (where the term system refers to all or a portion of the virtual network for Web routers discussed above). A Web router may thus be configured with its set of neighbor Web routers. Such a configuration may be a table of neighbor Web routers which is defined by a network service provider and/or is dynamically updated.")

Referring to claim 7,

Garcia teaches the method of claim 1, wherein each cache server system and associated DNS device is located at or near an entry point of the network. (para.[0062], "For example, clients 105 may have accounts with local Internet service providers (ISPs) 110 that enable the clients to connect to the Internet using conventional dial-up

or one of a variety of high-speed connections (e.g., DSL connections, cable connections, hybrids involving satellite and dial-up connections, etc.). ISPs 110, in turn, may provide direct connections to the Internet or, as shown, may rely on other service providers 120, 130, 140, to provide connections through to a set of high-speed connections between computer resources known as a backbone 150. ", para. [0067] To reduce communication and processing overhead in Web routers, a topology of Web routers is defined, such that a given Web router has as its neighbor Web routers a subset of all the Web routers in the system (where the term system refers to all or a portion of the virtual network for Web routers discussed above). A Web router may thus be configured with its set of neighbor Web routers. Such a configuration may be a table of neighbor Web routers which is defined by a network service provider and/or is dynamically updated.")

Referring to claim 9,

Garcia teaches the method of claim 1, wherein at least one of the cache server systems comprises at least two cache serves connected in a cluster, and wherein the at least two cache servers are coupled to a switch usable to select from among the at least two cache serves based on a selection policy. (para.[0073], "In a further embodiment, one of the following four mechanisms, or, a combination of some of the following four mechanisms, is or may be used to communicate the best Web cache or content server, or the set of Web caches, which should serve a client's request: [0074] (1) direct cache selection; [0075] (2) redirect cache selection; [0076] (3) remote DNS cache selection; and [0077] (4) client DNS cache selection. These approaches

are disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200,404, entitled "System and Method for Using a Mapping Between Client Addresses and Addresses of Caches to Support Content Delivery", filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference.")

Referring to claim 14,

Garcia teaches the method of claim 1, further comprising after discontinuing advertisement by a DNS device for an associated cache server system having a load characteristic that exceeds the predefined overload metric, restarting advertising when the load characteristic decreases below the predefined overload metric(para.[0086], "The specific algorithm that a Web router executes to compute the distance to the nearest Web cache storing a copy of an information object depends on the routing information that the Web routers use to compute distances to other Web routers, which are collocated with the Web caches storing information objects. A Web router is informed by its local Web caches of the load in the Web caches and the information objects stored in the Web caches. Hence, a Web router knows that its distance to information objects stored in local Web caches is the latency incurred in obtaining those objects from the local Web caches, which is a direct function of the load in those Web caches. Given that a Web router executes a routing algorithm enabling the Web router to know its distance to other Web routers, a Web router selects the nearest Web cache storing a copy of an information object by comparing the local distance to the information object (which is the latency incurred by a local Web cache if the object is

stored locally or infinity if the object is not stored locally) with the reported matches of object identifiers to Web caches reported by its neighbor Web routers. The object-cache match report for a given information object specifies the information object identifier, the Web cache where the information object is stored, the Web router that is local to that Web cache, and the distance to the Web cache. The distance specified in the object-cache match report includes explicitly or implicitly the distance from the neighbor Web router to the Web cache specified in the report, plus the load of the Web cache specified in the report. The Web router then chooses the match of information object to Web cache that produces the minimum distance to the Web cache storing the object.”)

Referring to claim 15,

Garcia teaches the method of claim 1, further comprising, if a DNS device discontinues advertisement of its associated cache server system, continuing to use the cache server system by another system that has already resolved a DNS name to the DNS device, until the DNS name expires(para.[0086], “The specific algorithm that a Web router executes to compute the distance to the nearest Web cache storing a copy of an information object depends on the routing information that the Web routers use to compute distances to other Web routers, which are collocated with the Web caches storing information objects. A Web router is informed by its local Web caches of the load in the Web caches and the information objects stored in the Web caches. Hence, a Web router knows that its distance to information objects stored in local Web caches is the latency incurred in obtaining those objects from the local Web caches, which is a

direct function of the load in those Web caches. Given that a Web router executes a routing algorithm enabling the Web router to know its distance to other Web routers, a Web router selects the nearest Web cache storing a copy of an information object by comparing the local distance to the information object (which is the latency incurred by a local Web cache if the object is stored locally or infinity if the object is not stored locally) with the reported matches of object identifiers to Web caches reported by its neighbor Web routers. The object-cache match report for a given information object specifies the information object identifier, the Web cache where the information object is stored, the Web router that is local to that Web cache, and the distance to the Web cache. The distance specified in the object-cache match report includes explicitly or implicitly the distance from the neighbor Web router to the Web cache specified in the report, plus the load of the Web cache specified in the report. The Web router then chooses the match of information object to Web cache that produces the minimum distance to the Web cache storing the object.”)

Referring to claim 16,

Garcia teaches the method as recited in claim 3, further comprising storing, by each of the routers, multiple routes in association with the common address in a routing table address (para.[0158], “Thus a scheme for enabling the discovery of the caches and servers storing information objects distributed over computer networks, which can be implemented in hardware and/or software, has been described. It should be appreciated that some embodiments of the present invention make use of so-called network-layer URL (NURL) routing. This routing technique involves mapping requested

URLs to unicast addresses, which are then used as an any cast IP address (i.e., a unicast address advertised by multiple, physically distinct points in an internet). See, e.g., Craig Partridge, Trevor Mendez, and Walter Milliken, "Host any casting service RFC 1546," November 1993. A system and method for using uniform resource locators (URLs) to map application layer content names to network layer anycast addresses, the aforementioned mapping, is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200,511, entitled "System and Method for Using URLs to Map Application Layer Content Names to Network Layer Anycast Addresses", filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference. Furthermore, a system and method for using network layer URL routing to locate the closest server carrying specific content (network-level routing of URLs) is disclosed in co-pending and commonly-owned U.S. Provisional Application No. 60/200,402, entitled "System and Method for Using Network Layer URL Routing to Locate the Closest Server Carrying Specific Content (NURL Routing) filed Apr. 28, 2000 by J. J. Garcia-Luna-Aceves and Bradley R. Smith, the complete disclosure of which is hereby incorporated by reference.");

Referring to claim 17,

Garcia teaches the method as recited in claim 16, further comprising: receiving a DNS resolution request at one of the routers, wherein the request specifies the common address and requests resolution of a DNS name; selecting a route representing the shortest network distance to one of the DNS devices; and resolving the DNS name to a unique address of the cache server system associated with the one of the DSN devices.

(para.[0079], "In general, Web routers execute WILD to map the address of a client into: (a) one or more addresses of Web caches or the content server that has the best TOS distance to the client address, and (b) one or more addresses of redirecting Web routers that have the best TOS distance to the client address. This mapping is done independently of whether the Web caches or content server maintains a local copy of any of the information objects required by the client. Web routers execute WILD to also map the identifier of an information object into: (a) one or more addresses of Web caches or the content server that stores the information object and is nearest to the Web routers according to TOS parameters. A given Web router thus maintains: [0080] For each address and/or address range corresponding to a set of potential clients, the address of a Web cache, proxy, content server, and/or redirecting Web router that has the best TOS distance to the client address and the value of such TOS distance. [0081] For each information object, the address of a Web cache, proxy, or content server that has the best TOS distance to the Web router.")

Conclusion

Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the

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claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashok B. Patel whose telephone number is (571) 272-3972. The examiner can normally be reached on 6:30 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan A. Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Ashok Patel

Examiner

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